Wartime Competencies for the USAF Nurse: Training for Sustainment

Phase IV:

Web-based versus Paper-and-Pencil Cognitive

Evaluation

Elizabeth Bridges, Lt Col USAF NC, Rosemary Wells, RRT, Pat Alvoet, Lt Col USAF NC, Amanda Flagg, Maj USAF NC (Ret), Laura Bass, Maj USAF NC

Purpose

- To increase readiness of the Air Force 46N3 clinical nurses using a standardized cognitive evaluation and innovative simulation laboratory

- To evaluate the sustainment of these skills and knowledge

- **Phase IV**: Evaluate the differences in test scores and attitudes towards the medium of testing between groups of nurses who complete the exam via the computer versus paper-and-pencil medium.

Research Questions

- Is there a difference in test scores based on completion of the cognitive examination in the paper-and-pencil format compared to a computer-based format?

- Is there a difference in the attitudes of the participants regarding the cognitive testing medium (computer versus paper-and-pencil)?

Methods

- **Design**: Posttest only design with one factor, test mode (parallel computer based or paper-and-pencil test)
- Post-test attitude survey

- **Sample:** 60 clinical nurses (46N3), working in either the inpatient or outpatient setting, were randomly assigned to complete the computer or paper-and-pencil test (30 per group)

Results

Cognitive Exam Results Computer vs. Paper-and Pencil

Cardiovascular (20 items)*	**67 $\pm$ 13%**
✦Computer	72 $\pm$ 12%
✦Paper-and-Pencil	63 $\pm$ 13%
Respiratory (25 items)	**55 $\pm$ 9%**
✦Computer	55 $\pm$ 9%
✦Paper-and-Pencil	54 $\pm$ 8%
Burns & Wound Management (19 items)*	**58 $\pm$ 12%**
	62 $\pm$ 12%
✦Computer	54 $\pm$ 12%
✦Paper-and-Pencil	

GI/GU/Fluids & Electrolytes (6 items) ✈Computer ✈Paper-and-Pencil	**58 ± 20%** 58 ± 22% 58 ± 18%
Ortho/Neuro (15 items) ✈Computer ✈Paper-and-Pencil	**63 ± 13%** 61 ± 12% 58 ± 12%
NBC/Triage/Meds/Pain Management (25 items) ✈Computer ✈Paper-and-Pencil	**58 ± 11%** 58 ± 12% 57 ± 9%
Total (109 items) •Computer •Paper-and-Pencil	**60 ± 8%** 61 ± 8% 57 ± 7%

*Significant difference between computer/paper-and-pencil p < .05)

Items Scoring Highest

- Method of "last resort" for bleeding   100%
- Placement of pulse oximetry probe   97%
- Differentiation of types of shock   97%
- Immunizations 95%
- C-collar/logrolling   93%
- Initial management of severe bleeding 93%
- Sprain management (RICE) 90%
- Initial management of airway obstruction   88%
- Haldol/Combat Stress Reaction   87%
- Field dressing – neck wound   87%

Items Scoring Lowest

- ✈ Management of amputation   5%
- ✈ Management of frostbite   7%
- ✈ Suction technique   7%
- ✈ Management of mustard injury   8%
- ✈ Dehydration/Malnutrition Rx   8%
- ✈ Airway management/ETT   18%
- ✈ Frostbite prevention   18%
- ✈ Epinephrine dose for anaphylaxis 23%
- ✈ Crush injury – complications   23%
- ✈ Skin care – field environment   27%

Examples

Chemical Casualty Management

Initial treatment for an alkali burn wound consists of:

A. Rinsing with copious water
B. Applying a neutralizing agent
C. Debriding a wound aggressivel
D. Applying silver sulfadiazine

Bomb Blast/Ocular Trauma

- You are responding to a terrorist bombing near your facility. A number of the victims have suffered ocular trauma due to flying glass and debris. You are caring for a victim with a presumed corneal abrasion. Which of the following is correct regarding the emergent management of this patient?

- A. Patch the unaffected eye to reduce the risk of further injury
- B. Prepare for emergency evacuation for definitive evaluation
- C. Irrigate eye, apply ophthalmic antibiotics and patch eye, prn
- D. Avoid pressure to the eye and initiate intravenous antibiotics

Impaled Object

You are in a convoy that comes under fire. You are caring for a soldier who has a wooden spike impaled in his chest. Emergent management would include assessing the ABCs, starting two

A. Removing the impaled object
B. Administering tetanus prophylaxis
C. Applying direct pressure and dressing the w
D. Preparing for immediate aeromedical evac

Participant's Perception of Utility of Exam

	Not Useful	Minimally Useful	Slightly Useful	Moderately Useful	Highly Useful
Overall readiness	2%	0%	6%	58%	34%
Areas for further preparation	6%	0%	10%	36%	48%
Areas for which I am ready to deploy	4%	4%	16%	36%	40%

Participant's Perception of Exam

	Strongly Disagree/ Disagree	Neutral	Agree/ Strongly Agree
Fair assessment of my knowledge	12%	14%	73%
Impartial method of Assessment	10%	18%	72%
Would recommend test to colleagues	4%	16%	80%

Conclusions

✈ Validated standardized assessment of knowledge and performance of required warskills competencies for USAF clinical nurses

✈ Content reflects current real-world requirements

✈ No significant difference between paper-and-pencil and computer-based test (equivalent exams)

✈ Results similar to earlier versions of exam with regard to % correct and items scoring highest/lowest

✈ Results will inform future readiness plans

✈ Content is **service neutral** – may also be useful for Army and Navy

www.usuhs.mil/tsnrp